

## Multi-site joint inversion of receiver functions and surface-wave phase velocities for estimation of sedimentary layer structure

# Takeshi Kurose[1], Hiroaki Yamanaka[2]

[1] Environmental Sci.and Tech.,Tokyo Inst.of Tech., [2] T.I.Tech

First, the inversion method of receiver functions by genetic algorithms is proposed, and its applicability and problems in estimating shear wave velocity structure of sedimentary layers are discussed by applying it to the earthquake records obtained at Tokyo observatory of Japan Meteorological Agency(JMA). It was indicated that the subsurface structure at the site can be modeled using 4 layers with shear wave velocities of 0.6, 0.8, 1.3 and 3.0(km/s),respectively. It was also proved that the inversion result is not unique due to the trade-off between shear wave velocities and thicknesses.

Next, multi-site joint inversion method(abbreviated as MSJ) of receiver functions and surface-wave phase velocities is proposed, assuming that the shear wave velocities of each layer in target area are constant and the noises in observed data at each site have no correlation with each other. The MSJ was applied to the receiver function at Tokyo observatory described above and phase velocities obtained from microtremor array observations performed at Koto and Shibuya district, Tokyo Metropolis. It was indicated that the subsurface structure in the target area can be modeled using 4 layers with shear wave velocities of 0.5, 0.8, 1.4 and 3.0(km/s),respectively. It was also shown that the trade-off between shear wave velocities and thicknesses in inverting only receiver functions can be avoided by the MSJ, assuring the uniqueness of inversion result.